

Application Serial No. 10/584,009
Reply to office action of April 30, 2008

AUG 28 2008 PATENT
Docket: CU-4897

Amendments To The Claims

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (currently amended) An inverted L antenna comprising:

a printed circuit board (PCB), wherein

the PCB is substantially planar along an x-axis and a z-axis,

the PCB is provided with a metal layer, a dielectric layer and a ground layer,

the PCB has a main body and a tapered edge protrusion, the tapered edge protrusion having a corresponding apex positioned furthest away from the main body,

the tapered edge protrusion comprising a portion of the metal layer and a portion of the ground layer,

the tapered edge protrusion configured to provide an edge electric field substantially oriented along the z-axis; and

an antenna element coupled to ~~a portion of~~ the metal layer, wherein

the antenna element overlaps the apex and part of the tapered edge protrusion, and

a portion of the antenna element extends away from the PCB beyond the apex along the z-axis, such that

the antenna element is configured to provide an antenna

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~~electric field oriented along the z-axis in such a way that the portion
dominantly generates an electric field parallel to an electric field
generated by the antenna element.~~

2. (currently amended) The inverted L antenna of claim 1, wherein the tapered edge protrusion is a metal layer is formed in a semi-circle shaped tapered edge protrusion at the portion.
3. (currently amended) The inverted L antenna of claim 1, wherein the tapered edge protrusion is a triangular shaped tapered edge protrusion metal layer is formed in triangle at the portion.
4. (currently amended) The inverted L antenna of claim 1, wherein the tapered edge protrusion is an metal layer is formed in oval shaped tapered edge protrusion at the portion.
5. (currently amended) The inverted L antenna of claim 1, wherein the printed circuit board further includes:
 - [[a]] the dielectric layer is formed on a bottom surface of the metal layer; and
 - [[a]] the ground layer formed on a bottom surface of the dielectric layer.
6. (currently amended) The inverted L antenna of claim 1, wherein the shape of the portion of the ground layer of the tapered edge protrusion under the portion is

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substantially equal to that of the shape the portion of the metal layer of the tapered edge protrusion.

7. (currently amended) The inverted L antenna of claim 1, wherein the tapered edged protrusion further comprises a portion of the dielectric layer ~~portion is elongated from an edge of the printed circuit board.~~

8. (currently amended) The inverted L antenna of claim 1, wherein the electric field generated at the portion is caused by a signal inputted ~~[[form]]~~ from an electric device mounted on the printed circuit board.

9. (currently amended) An inverted L antenna comprising:

a printed circuit board (PCB), wherein

the PCB is substantially planar along an x-axis and a z-axis,

the PCB is provided with a metal layer, a dielectric layer and a ground layer,

the PCB has a main body and a plurality of tapered edge protrusions, each tapered edge protrusion having a respective apex positioned furthest away from the main body,

each tapered edge protrusion comprising a portion of the metal layer and a portion of the ground layer,

each tapered edge protrusion configured to provide a corresponding edge electric field substantially oriented along the x-z

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plane; and

a plurality of antenna elements coupled to a portion of the metal layer,
wherein

each antenna element overlaps part of one corresponding tapered
edge protrusion and overlaps the respective apex of the one corresponding
tapered edge protrusion,

a part of each antenna element extends away from the PCB beyond
the respective apex of the one corresponding tapered edge protrusion
along the x-z plane, such that

each antenna element is configured to provide a corresponding
antenna electric field oriented along the x-z plane provided with at least
one metal layer; and an N number of antenna elements coupled to a
corresponding number of portions of the metal layer in such a way that
each of the portions dominantly generates an electric field parallel to an
electric field generated by a corresponding antenna element, wherein N is a
positive integer.

10. (currently amended) The inverted L antenna of claim 9, wherein ~~each of the portions are formed on the metal layer in such a way that they cause a minimum interference therebetween~~ each tapered edge protrusion is a semi-circular shape.

11. (currently amended) A mobile terminal comprising:
a printed circuit board board (PCB), wherein

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the PCB is substantially planar along an x-axis and a z-axis,

the PCB is provided with a metal layer, a dielectric layer and a ground layer,

the PCB has a main body and a tapered edge protrusion, the tapered edge protrusion having a corresponding apex positioned furthest away from the main body,

the tapered edge protrusion comprising a portion of the metal layer and a portion of the ground layer,

the tapered edge protrusion configured to provide an edge electric field substantially oriented along the x-z plane; and

an antenna element coupled to the metal layer, wherein

the antenna element overlaps the apex and part of the tapered edge protrusion, and

a portion of the antenna element extends linearly away from the PCB beyond the apex along the x-z plane, such that

the antenna element is configured to provide an antenna electric field oriented along the x-z plane coupled to a corner edge of the metal layer in such a way that the corner edge dominantly generates an electric field parallel to an electric field generated by the antenna element, wherein the direction of electric field generated at the antenna element is approximately perpendicular to a surface of an earth.

12. (currently amended) The mobile terminal of the claim 11, wherein the antenna

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element is arranged in such a way that it is inclined at a predetermined angle away the
PCB from a side edge line of the metal layer.

13. (currently amended) The mobile terminal of claim 12, wherein the
predetermined ~~angel in~~ angle is approximately 45 degrees.

14. (new) The inverted L antenna of claim 6, wherein the tapered edge protrusion
further comprises a portion of the dielectric layer wherein the shape of the
dielectric layer is substantially equal to that of the shape of the portions of the
ground and metal layers.

15. (new) The inverted L antenna of claim 6, wherein the tapered edge protrusion
further comprises a portion of the dielectric layer wherein the shape of the
dielectric layer is not substantially equal to that of the shape of the portions of
the ground and metal layers